

Infant and Toddler Brain Development

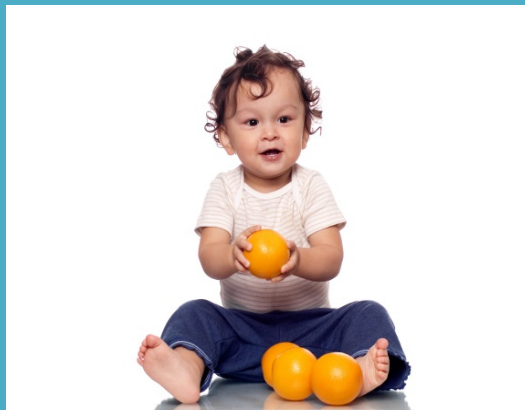
It's important for providers of early intervention services to understand the basics of infant and toddler brain development. Brain development research answers the basic question of why early intervention is so important and why a child should not wait until he/she goes to school to receive services. Research demonstrates that the brain is the most malleable or "plastic" during the infant and toddler years.

The brain is much more sensitive to experiences in the first few years of life than in later years. (Tierney & NELSON III, 2009)

Providing early intervention services is both an exciting opportunity, because of the potential for rapid change and improvement, and a great responsibility, because the intervention, or lack of appropriate intervention, can have life-long effects on the child.

During the infant and toddler period, the brain undergoes tremendous growth and development. A newborn's brain is only 25% of the size of an adult's brain. In contrast, a three-year-old's brain is 80% of the size of an adult's. During the first three years of life, the brain develops millions of connections, or synapses, between the existing neurons. At its peak, the cerebral cortex creates an astonishing two million new synapses every second (Zero to Three). These connections are strengthened or "pruned" depending on use, both positive and negative.

The Zero to Three website has a "[brain map](#)" that provides information about brain development at different ages.



In addition, here you can view a short video from the [National Scientific Center on the Developing Child at Harvard University](#) that summarizes the importance of early brain development. Listen to how the narrator describes how connections that are used more grow stronger.

The Centers for Disease Control and Prevention (CDC) provides information on Adverse Childhood Experiences (ACEs) affecting brain development, which have a tremendous impact on one's lifelong health. The [ACEs](#) study highlights the importance of promoting lifelong health and well-being through safe, stable and nurturing relationships and environments for all children.

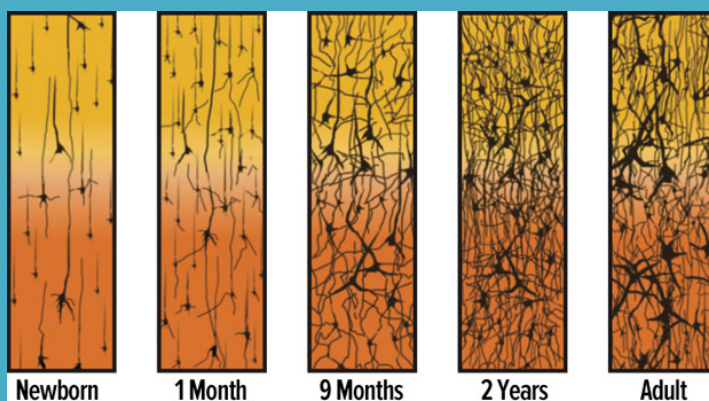
Activity

After visiting the "[brain map](#)" on the Zero to Three website, what are two things you thought about in relation to working with infants and toddlers? **Discuss with your supervisor.**



Experiences

- Our brains are wired to respond to the sound of speech; when babies hear people speaking, the neural systems in their brains responsible for speech and language receive the necessary stimulation to organize and function (Perry, 2006).
- The more babies are exposed to people speaking, the stronger their related synapses become.



This graphic illustrates how brain synapses increase as the child grows. It also demonstrates how certain synapses are strengthened (darker/bolder lines) through consistent use. Source: Corel, JL. The postnatal development of the human cerebral cortex.

Cambridge, MA: Harvard University Press; 1975.

Additional Resources

[Zero To Three](#)

[Frank Porter Graham Child Development Institute](#)

[Center on the Developing Child Harvard University](#)

[Center for Disease Control - Adverse Childhood Experiences](#)